AMENDMENTS TO THE SPECIFICATION

Please amend page 9, beginning at line 10, as follows:

isolator plate 55, and the low thermal conductivity coolant tubes 61 provide conductive thermal isolation of the calorimeter 12.

Further, the thermal isolation system includes material to insulate the calorimeter body 12 from the surrounding environment. Given by way of nonlimiting example, in one presently preferred embodiment, the insulation 59 is fabricated from Polyimide foam with an outer covering that reflects radiation. The insulation 59 suitably is designed with structural rigidity such that at installation an airgap 63 is provided between the calorimeter body 12 and the insulation 59. Advantageously, the insulation 59 and airgap 63 provide radiative and convective isolation of the calorimeter body 12.

Referring now to FIGURE 2A, details of an exemplary, non-limiting example of the body 12 will now be explained. A first chamber 112 has a first axis a_1 and is configured to receive a beam 114 of radiation. The first chamber 112 is further configured to attenuate the beam 114 and direct a portion of the beam 114 into a second chamber 116. The portion of the beam 114 directed into the second chamber 116 may range up to 100% of the beam. The second chamber 116 has a second axis a_2 that is not collinear with the first axis a_1. The second chamber 116 is configured to receive at least a portion of the beam 114. The second chamber 116 is further configured to further attenuate at least a portion of the beam 114, such that the two chambers 112 and 116 together absorb or otherwise capture substantially all of the radiation.

The first chamber 112 defines an opening 124 at a first end 126 of the first chamber 112. The opening 124 defines an aperture 125 in the body 118 that advantageously is sized to admit the entire beam 114. In one presently preferred embodiment, the opening 124 is larger than a footprint of the beam 114.

First and second faces 128 and 130 extend from the first end 126 to a throat 132 at a second end 134 of the first chamber 112. The first and second faces 128 and 130 define an angle α

between them. The first and second faces 128 and 130 narrow at the angle α along the axis a_1 from the first end 126 to the throat 132 at the second end 134. The angle α suitably has any value as desired for a particular application. However, given by way of non-limiting example, in one embodiment the angle α has a value of around 28°. In another exemplary embodiment, given by way of non-limiting example the angle α suitably may have a value of around 32°. While it is emphasized that the angle α may be selected to have any angle as desired, the non-limiting values given above for the angle α have been determined to attenuate a prescribed amount of energy of the beam 14 while minimizing back-scatter and back-reflection.

The second chamber 116 defines an opening 136 at a first end 138. The opening 136 is configured to admit a portion of the beam 114 through the throat 132. It will be appreciated that portions of the beam 114 that reflect off the first or second face 128 and 130 may also be admitted through the opening 136. Third and fourth faces 140 and 142 define an angle β therebetween. The third and fourth faces 140 and 142 narrow at the angle β along the axis a_2 to a vertex 144 at a second end 146. Similar to the angle α, the angle β suitably can have any value as desired. In one present embodiment, the angle β advantageously has a value of around 15°. It has been determined that a value of around 15°, in concert with values of either around 28° or around 32° for the angle α, advantageously attenuates substantially all of the energy of the beam 114 and minimizes local heating, back-scatter and back-reflections. However, it is emphasized that the angle β may have any value as desired for a particular application.

If desired, the second chamber 116 may optionally include additional faces such as a fifth face 148. If provided, the fifth face 148 may extend from the end of the first face 128 at the second end 134 of the first chamber 112 to the end of the third face 140 at the first end 138 of the second chamber 116. If desired, the fifth face 148 may be provided to provide a greater amount of non-collinearity between the axes α_1 and α_2. Advantageously, within certain limits, increasing the amount of non-collinearity between the axis α_1 and α_2 mitigates even further any amount of back-scatter or back-reflection.

Referring now to FIGURES 1 and 2A, one exemplary embodiment of the calorimeter 10 includes an integral calibration system including a built-in electrical heating system 26. A plurality of electrical heaters 100 are used as part of the calibration process. By supplying a known amount of electrical power to the heaters 100 for a known period of time a known amount of energy is deposited in the calorimeter body 12. Subsequently, a measurement of the change in the temperature of the body 12 is performed by the temperature sensor system 16 and the heat capacitance may be calculated. The calorimeter system thus allows direct determination and verification of its own thermal capacitance. Given by way of nonlimiting example, in one preferred embodiment the heaters 100 are Chromalox CIR-20252-120 cartridge heaters.

In one presently preferred embodiment, the body 12 can absorb radiation within a dynamic range of between around 20 Kilojoules (KJ) and around 400 KJ and does not require any cooling of the body 12 during the measurement process. Because the body 12 of the calorimeter 10 will capture and absorb substantially all of the energy of the radiation 22, the body 12 may be cooled post-measurement to allow for subsequent measurements. If the input energy is high enough, successive runs without either active cooling or sufficient time